Paper No. 35

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte ALAN A. GILMORE

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Appeal No. 1999-2638
Application No. 08/834,774

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HEARD: January 8, 2002

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Before LALL, LEVY, and BLANKENSHIP, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-8, 11, 12, and 21-30.

We reverse.

BACKGROUND

The invention is directed to a method and apparatus for controlling the effective torque output of a power tool. Claim 1 is reproduced below.

> 1. A power tool having an electric motor for driving an output spindle having a tool holder operatively coupled thereto, an operator actuable switch for controlling the amount of power applied to the motor, and a control circuit for modulating the power supplied to the motor in accordance with the position of said switch by varying the duty cycle of a constant frequency, pulse width modulated (PWM) direct current (d.c.) control signal generated by the control circuit to thereby control the speed of the motor; the improvement wherein the frequency of the PWM d.c. control signal generated by said control circuit is less than 50 Hz.

The examiner relies on the following reference:

Saar et al. (Saar)	4,447,786	May 8, 1984

Claims 1-8, 11, 12, and 21-30 stand rejected under 35 U.S.C. § 103 as being unpatentable over Saar.

Claims 19 and 20 have been allowed. Although the Examiner's Answer, at page 4, includes claims 19 and 20 as standing rejected, page 5 of the Answer unequivocally indicates that the examiner considers the claims to be allowable.

Claims 9, 10, and 13-18 have been canceled.

We refer to the Final Rejection (mailed March 30, 1998) and the Examiner's Answer (mailed Dec. 18, 1998) for a statement of the examiner's position and to the Brief (filed Oct. 1, 1998) and the Reply Brief (filed Feb. 22, 1999) for appellant's position with respect to the claims which stand rejected.

OPINION

At the outset, we note that the instant file wrapper contains a paper filed pursuant to 37 CFR § 1.181, with a filing date the same as that of the Reply Brief (Feb. 22, 1999), requesting reconsideration of the examiner's deemed grouping of the claims. There is no indication in the record, however, that the petition was ever considered; no paper has been filed by the Office in response. To avoid remand of the instant application for due consideration of the paper, with the concomitant delay in disposition of the instant appeal, at the oral hearing appellant's representative agreed to withdraw the request for reconsideration.[1]

We turn to consider the claims at issue. We observe that three of the independent claims before us -- 1, 3, and 7 -- are drafted in the well-known Jepson format. We interpret each as setting forth elements which are conventional or known in the portion preceding "the improvement comprising," with the conventional or known elements forming part of the combination. See, e.g., Rowe v. Dror, 112 F.3d 473, 478, 42 USPQ2d 1550, 1553 (Fed. Cir. 1997).

[1] Moreover, under current rules, the Board ultimately determines the effective grouping of the claims, based on the arguments presented by the appellant. See 37 CFR § 1.192(c)(7) ("For each ground of rejection which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable.").

Appellant's main contention, in view of the arguments presented in the briefs, is that the section 103 rejection over Saar is erroneous because, contrary to the examiner's findings, the reference does not disclose the pulse width modulated (PWM) signal to be of "constant frequency." The feature is a requirement of, for example, instant (Jepson format) claim 1.

We find Saar to be directed to a waveform synthesizer suitable for driving AC motors in hand-held power tools having a DC power source (e.g., col. 1, ll. 12-48). In particular, Saar is directed to the problem of "selectively switch[ing] power pulses of selected pulse width, spacing, and repetition rate from an oppositely poled direct current power source to the power receiving device to synthesize a current waveform of selected wave shape and frequency." Col. 2, ll. 14-19.

As shown in Figure 1, and as described at column 3, line 16 through column 4, line 60, switching device 12 receives input power from positive and negative buses 14 and 16 of the DC power supply. Since switching device 12 is switching DC voltage (Fig. 2A) into load 18, it is desirable that the load have some inductive reactance to develop the desired wave shape (Fig. 2). Figure 2A shows the pulse width switch-modulated output of switching device 12. The amplitude of the pulses is controlled by the supplied DC voltage, and the duration of each pulse and the inter-pulse spacing are independently controlled by the switching information provided from the memory 20. For synthesizing the sine wave shown in Figure 2, the switched voltage output of device 12 has a comparatively narrow

pulse duration with the next successive pulses having progressively greater pulse durations. The center pulse has the greatest duration, with the succeeding pulses having progressively diminishing durations. By controlling the number, spacing, and width of the output pulses, a waveform of desired shape can be obtained. Different wave shapes are stored within memory 20, and may be selected by microprocessor 24 addressing a different page within the memory. Frequency of the synthesized output waveform can be changed by changing the programmable frequency divider 32. The reference discloses a "practical embodiment" (Fig. 3) of the inventive waveform synthesizer, described at column 5, line 7 et seq.

Appellant contends that the pulses shown in Figure 2A of the reference are not of "constant frequency" (e.g., Brief at 8-9; Reply Brief at 2-5). The examiner states the view: "Saar et al.'s figure 2A is produced for every cycle. Thus if the frequency is 48 Hz the PWM is at 48 Hz. Clearly, in column 9 lines 30-36 teach [sic] that the lower the constant frequency i.e. 6 Hz the slower the speed." (Final Rejection at 3.)

Figure 2A of Saar, presumably, shows half a wavelength of a periodic signal, which corresponds to the half-wavelength sine wave shown in Figure 2. Further, presumably, the second half of the wavelength of Figure 2A, corresponding to the second (negative) half of the sine waveform (not shown), would appear as a folded mirror image of the signal shown -- that is, with pulses equal in width and magnitude to those shown, but of opposite polarity. The entire pulsed signal is produced from the DC source at buses 14 and 16 (Fig. 1). The

periodic waveform shown in Saar's Figure 2A, producing and corresponding to the periodic, constant frequency sine wave shown in Figure 2, might thus be considered a "constant frequency, pulse width modulated (PWM) direct current (d.c.) control signal generated by the control circuit," as set forth in instant claim 1.

Claim 1, however, further requires that the control circuit modulates "the power supplied to the motor in accordance with the position of said [operator actuable] switch by varying the duty cycle of ... [the constant frequency signal] to thereby control the speed of the motor" (emphasis added). A definition for “duty cycle,” pertinent to the electronic arts, is “the ratio of the ‘on’ period of a pulse to the total pulse period.” Academic Press Dictionary of Science and Technology, Harcourt, available at http://www.harcourt.com/dictionary/def/3/2/9/8/3298000.html (Jan. 17, 2002). Saar discloses controlling the number, spacing, and width of the pulses output from switching device 12 in order to synthesize different waveforms. It is far from clear, on this record, that controlling the number, spacing, and width of pulses within a periodic signal of relatively long wavelength could be considered “varying the duty cycle” of a constant frequency signal.

Even assuming that changing the number, spacing, and width of the pulses -- i.e., selecting the waveform -- as disclosed by Saar falls within the meaning of varying the duty cycle of a constant frequency signal, claim 1 further requires that variation of the duty cycle is in accordance with the position of an operator actuable switch, and thereby controlling

the speed of the motor. Waveform selection is described by Saar at column 3, lines 58-62: "The microprocessor **24**, in response to either internal instructions or externally inputted instructions provided through, for example, a user input interface and/or condition responsive transducers, addresses a selected one of the p available pages within the memory 20...."

The examiner takes "official notice" (Final Rejection at 2-3) of the artisan's knowledge of power switches to adjust the speed of a motor, and mode selecting switches for high and low speed operation of a power tool. Saar, however, at column 6, line 53 through column 7, line 8 describes such switches. Considering the reference as a whole, we agree with appellant, as argued on pages 3 and 4 of the Reply Brief, that Saar does not disclose or suggest varying the duty cycle of the signal in accordance with the position of a switch to control the speed of a motor. We find that Saar discloses varying the frequency of the signal in accordance with the position of a switch to thereby control the speed of the motor. See, for example, the flow chart disclosed in Figure 4 of the reference.[2]

In general, the preamble of an apparatus claim may be entitled to little patentable weight if the language merely sets out an intended field of use. However, an accepted

[2] Saar also discloses, in Figure 5 and column 8, line 28 through column 9, line 5, selecting different waveforms for providing constant output torque. Whether the artisan might interpret this as "varying the duty cycle" of the constant frequency signal, and thereby controlling the speed of the motor, would be speculative. In any event, the method measures actual torque, and selects the waveform accordingly, rather than selecting the waveform "in accordance with the position" of an operator actuable switch.

principle in the interpretation of a Jepson-type claim is that the preamble represents actual scope of the claim, rather than mere field of use. Therefore, a rejection under 35 U.S.C. § 103, which is required to set out underlying factual findings as described by Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966), must show how the combination as a whole would have been rendered obvious by the prior art, including the limitations in the preamble of the claim. The claims are not directed merely to "improvements," but to improvements within the prior art structures set forth. That Saar might disclose that a "PWM d.c. control signal generated by [the] control circuit is less than 50 Hz" (claim 1) is not dispositive. The reference fails to disclose or suggest all the requirements of claim 1.[3]

We therefore cannot sustain the section 103 rejection of claim 1 over Saar. Nor can we sustain the rejection of claim 3, for substantially the same reasons. The claim requires modulating the power supplied to the motor "in accordance with the position of said [operator actuable] switch by varying the duty cycle of a constant frequency, pulse width modulated (PWM) direct current (d.c.) control signal generated by the control circuit to thereby control the speed of the motor." At least this noted feature of the claim has not

[3] To rely on the implied admission rendered by the Jepson format, the proper ground of rejection would be under 35 U.S.C. § 103 as being unpatentable over appellants' admitted prior art in view of Saar. However, we find no motivation in the prior art before us for combining Saar's disclosure of a PWM signal with a power tool that controls the speed of the motor by varying the duty cycle of a constant frequency, PWM control signal, as described in the preamble of claim 1. Nor does the rejection of record supply any motivation for such combination.

been shown as disclosed or suggested by the reference. Further, we cannot sustain the rejections of method claims 11 and 27, which contain limitations of similar scope to those we have addressed with respect to claims 1 and 3, although rather than an "operator actuable switch," variation of a duty cycle is in response to an "operator actuable device."

Finally, we cannot sustain the rejection of instant claim 7. The allocation of burdens requires that the USPTO produce the factual basis for its rejection of an application under 35 U.S.C. § § 102 and 103. In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984) (citing In re Warner, 379 F.2d 1011, 1016, 154 USPQ 173, 177 (CCPA 1967)). The one who bears the initial burden of presenting a prima facie case of unpatentability is the examiner. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The rejection does not explain how Saar might be deemed to disclose or suggest all the limitations of claim 7 (see, e.g., Brief at 10); nor, for that matter, the further limitations in claims 3, 11, and 27 appellant points out in arguments in the Reply Brief.

Having not sustained the rejection of any of the independent claims (1, 3, 7, 11, 27) over the single reference applied, we thus do not sustain the section 103 rejection of claims 1-8, 11, 12, and 21-30 as being unpatentable over Saar.

CONCLUSION

The rejection of claims 1-8, 11, 12, and 21-30 is reversed.

REVERSED

PARSHOTAM S. LALL Administrative Patent Judge	)))))) BOARD OF PATENT) APPEALS) AND) INTERFERENCES)))
STUART S. LEVY Administrative Patent Judge	
HOWARD B. BLANKENSHIP Administrative Patent Judge	

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